Celebrate Life
For Home TPN and Tube Feeding Patients

ISSUE FOCUS:
Nutrition Support in Gastrointestinal Diseases

April 2012 | Issue 27
Contents

4 Pancreatitis and Nutrition Support
Pancreatitis is an inflammatory condition of the pancreas, an organ that secretes substances that aid digestion. Pancreatitis can cause digestive issues that lead to difficulty eating and problems getting proper nutrition. Learn how these problems can be addressed through the use of nutrition support therapies.

7 Short Bowel Syndrome & Bowel Rehabilitation: Reducing Your Need for Total Parenteral Nutrition
A reduction in TPN dependence can be achieved by many consumers with short bowel syndrome (SBS). Learn about the considerations that help predict an individual’s ability to reduce TPN dependence, signs that it may be time to try reducing TPN, and ways to monitor your progress while reducing TPN use.

10 Fistula Management: A Spectrum of Nutrition Care
Enterocutaneous fistulas (ECFs) are openings in the body that reach from a point in the gastrointestinal tract out to the skin. If you have an ECF, learn how a staged nutrition plan involving nutrition support may help fulfill your nutritional needs, as well as help your ECF heal faster.

13 Avoiding Nutritional Complications Following Bariatric Surgery
Bariatric surgery, which can help induce rapid weight loss in overweight patients, can lead to complications that result in the need for nutrition support. This article, an interview with a physician who treats these complications, highlights ways to avoid them.

17 The Use of Tube Feeding in GI Disease
Tube feeding can be a helpful nutrition support option in the care of various gastrointestinal (GI) diseases. This article explains the considerations for use of tube feeding, and the different GI diseases whose treatment can include tube feeding.

20 Sharon and Ronald Frug: Celebrating Milestones
Sharon Frug went on TPN in March 2011 and ended a seven-year battle with food and 14 years of bowel obstructions, kidney stones, and chronic diarrhea. Read the inspiring story of how TPN gave Sharon and Ronald their lives back.

25 2012 Small Steps to Big Steps Consumer Teleconference Series

26 Industry Insights: Medication Management to Treat and Control the Symptoms of GI Diseases
Medications are sometimes used to treat GI diseases. Read about the types of GI diseases for which medications are often prescribed, and how these medications help to relieve symptoms.

30 Advocacy Corner: Steering Clear of Complications
Whether you are new to the world of nutrition support or a long-time consumer, you have been furnished with an abundance of information, training and advice. This article can help you use your training to avoid the avoidable complications, and manage the unavoidable ones.
A Note from Our Guest Editor

In this issue of *Celebrate Life*, we dig into the topic of gastrointestinal (GI) diseases. These diseases often affect one’s ability to eat and drink, and maintain one’s current nutritional state. Many of these diseases not only require complicated medication or surgical therapy, but also the use of specialized nutrition support such as enteral nutrition (EN) and/or total parenteral nutrition (TPN). The use of home EN and home TPN has become an important aspect of the care of people with severe gastrointestinal disorders.

The authors of this issue’s articles have taken on some very difficult topics and questions. We start off with a look at both acute and chronic pancreatitis and the use of EN and TPN for these serious conditions. This is followed by a superb article that addresses a very complicated but often poorly described process — how we wean patients with a diagnosis of short bowel syndrome off of TPN. A third article looks at the use of nutrition support in the management of patients with gastrointestinal fistulas, which are typically connections between the bowel and the skin. Next, a world-class expert talks about avoiding complications that can cause the need for nutrition support in bariatric surgery patients. This is topped off by an intriguing article that answers an often-asked question — “when can EN be used in association with GI disease?”

This issue also contains an insightful look at the use of medications to control gastrointestinal symptoms, a “true to life” story from a patient with gastrointestinal disease on nutrition support, and finally, an advocacy column to help you or someone you know avoid complications when receiving home EN or TPN.

This is an entertaining and valuable issue of *Celebrate Life*. Sit back and relax and enjoy these articles. We look forward to your feedback.

Sincerely,

Mark H. DeLegge, MD, FACC, CNSP, AGAF, FASGE
Medical Director, Coram Specialty Infusion Services
Professor of Medicine, Medical University of South Carolina, Charleston, SC
Pancreatitis & Nutrition Support

By Mark H. DeLegge, MD
Pancreatitis is an inflammatory condition of the pancreas, an organ that secretes substances that aid digestion. Pancreatitis can cause digestive issues that lead to difficulty eating and problems getting proper nutrition. In many cases, these problems can be addressed through the use of nutrition support therapies — enteral nutrition (EN) and total parenteral nutrition (TPN).

Pancreatitis — Background
Pancreatitis can have any number of symptoms, including nausea, vomiting, abdominal pain and fever.1 The condition may resolve on its own and have minimal long-term injury to the pancreas. Or, in some cases, pancreatitis can be more severe, and can result in sepsis (total body infection), organ failure (kidney, liver, lungs), permanent pancreas damage, and even death. In these severe cases, a patient may require surgery to remove all or part of the pancreas. Patients with severe pancreatitis may require admission into the intensive care unit to receive treatments such as dialysis, blood pressure support, electrolyte management, and sometimes the use of a respirator.

Nutrition Problems with Pancreatitis
Chronic pancreatitis may develop from permanent injury to the pancreas, as well as scar tissue caused by severe pancreatitis.2 Because the pancreas is important in the production of insulin and digestive enzymes, injury to the pancreas may lead to elevated blood sugars (hyperglycemia) and malabsorption of nutrients, which results in diarrhea. Injury to the pancreas can also result in chronic abdominal pain and nausea that worsen with eating.

In fact, one of the major problems with acute and chronic pancreatitis is difficulty eating, which leads to a decline in a patient’s nutritional state. It is often hard for patients to eat because of abdominal pain, nausea, vomiting, and sometimes diarrhea. Weight loss and malnutrition may develop. Malnutrition can make the recovery process very difficult, as well as cause other problems such as poor wound healing, chronic infections, and loss of muscle strength and function. Therefore, adequate nutrition is an important component of pancreatitis treatment. When patients cannot be fed sufficiently by mouth, EN (nutrients delivered via a feeding tube) or TPN (a nutrient solution delivered into the vein via a venous catheter) may be required.

Nutrition Support for Pancreatitis Patients

Enteral Nutrition
Whenever someone eats, the pancreas begins to make digestive enzymes to aid in the breakdown of food. It was originally believed that it would be impossible to administer EN to a patient with pancreatitis because this would lead to “stimulation” of the pancreas and worsening pancreatitis. Therefore, patients were often treated with TPN. However, studies from the past 20 years have demonstrated that EN is safe and well-tolerated by a number of patients with pancreatitis.3 Benefits of EN over TPN include that it is less costly, and it is associated with a reduction in bloodstream infections and fewer occurrences of high blood glucose.

EN may be delivered into the stomach or small bowel (jejunum). Recent studies have shown that EN can be delivered into the jejunum without causing stimulation of the pancreas.
Such jejunal feeding would occur through a feeding tube placed into the jejunum through the skin (jejunostomy) or through the nose (nasojejunal). Other studies have shown that gastric feedings (into the stomach) are also well-tolerated by patients with pancreatitis, and don’t appear to worsen the condition. Gastric feedings are delivered through a feeding tube placed through the skin (gastrostomy) or through the nose (nasogastric). More studies will need to be performed in patients with pancreatitis before a recommendation for gastric feeding can be made.4

There has been debate about the type of tube feeding formula that is best used in pancreatitis patients. Some clinicians prefer formulas that are very low in fat content, believing that fat stimulates the pancreas to produce digestive enzymes. Other clinicians have had excellent results with standardized tube feeding formulas, which obtain approximately 40% of their calories from fats.

Total Parenteral Nutrition
TPN is currently used in patients who cannot receive EN due to problems such as small bowel obstruction, fistulas, severe ileus (paralysis of the small intestine), and colon (large bowel) obstruction. It is also used in patients who are receiving EN, but cannot meet their daily caloric goals because of associated nausea, vomiting, abdominal pain, diarrhea and/or severe bloating. In this situation, the treatment is referred to as supplemental TPN.

Pancreatitis can be a very serious disease. Treatment of pain, supporting the blood pressure, treatment of infections with antibiotics, electrolyte management, and sometimes respiratory support are required. In addition, adequate nutrition in the form of EN and TPN are often needed to prevent malnutrition in order to achieve the best outcomes, including survival.5 Nutrition support is a major and important component of the overall treatment of pancreatitis.

References
Short Bowel Syndrome & Bowel Rehabilitation: Reducing Your Need for Total Parenteral Nutrition

By Therese Austin, MS, RD, LD, CNSC
Although total parenteral nutrition (TPN)* can be a life-saving therapy for many with short bowel syndrome (SBS)*, a reduction in TPN dependence is a goal that can be achieved for many consumers with this condition. Read on to learn about the considerations that help predict an individual’s ability to reduce their TPN dependence, signs that it may be time to try reducing TPN, and ways for you to monitor your progress while reducing your use of TPN.

Factors Affecting TPN Dependence
After a major bowel resection*, most bowel adaptation* occurs within the first 2–5 years. Structural changes occur, including bowel dilation (increase in width) and elongation (increase in length). The function of the bowel also changes to improve the absorption of fluids and nutrients, slowing down the transit time to allow more contact time of nutrients within the bowel.

Research has shown that there are several factors that affect how well the bowel will adapt, and thus affect your chances of reducing dependence on TPN. Resuming an oral diet when bowel function returns after surgery is key to making this process work better. The anatomy of your bowel after a resection — such as the length of bowel remaining after surgery, and which parts are intact — also affects adaptation. People who have their ileum* intact often adapt much better than someone with only their jejunum*. When the remaining small bowel is still attached to the colon, absorption of fluid and nutrients is even greater. (See Figure 1.)

Diet Is Key to Reducing TPN Dependence
Choosing the right kinds of foods based on your bowel anatomy is critical to minimizing your stool or stoma* output so that your TPN can be reduced. Working closely with your TPN doctor and your Coram dietitian to modify your diet will help you do this. In general, you should eat small, frequent meals, chew your food thoroughly, and add salt to your food (unless contraindicated). Avoiding sweets and sugar-sweetened beverages, and increasing your intake of complex carbohydrates, such as bread, cereal and pasta, are recommended.

Fluids should be sipped slowly between meals and should be isosmolar. Isomolar fluids have a similar concentration of electrolytes as your blood and will not cause a shift of fluids into the GI tract. This helps to limit your stool or stoma output. Note that most sports drinks are not the right concentration of electrolytes to enhance absorption. See the recipes in Table 1 for examples of how to make fluids isosmolar.

The type of fiber found in products such as Benefiber®, Metamucil® and Citrucel® is called soluble fiber. This fiber helps to slow down the transit of food in the GI tract and stimulates growth of the bowel mucosa.* Check with your doctor to determine if adding soluble fiber to your diet a couple of times per day would be beneficial.
Monitoring and Weaning

There are several items to measure in determining if your TPN use can be reduced. Keeping a log of your intake and output can help you and your doctor make this determination.

First, you must have a good appetite and be able to eat several small meals each day. Monitoring how much stool or stoma output you have each day is necessary. Generally this output should be less than 1,800 ml before you start to minimize your TPN use, and you should be able to take in more fluids by mouth than you lose through your stoma/stool. For example, your intake of oral fluids in a 24-hour period should be at least 2 cups more than you lose through your ostomy or stool. Second, you want to make sure that you have urine output of at least 1,000 ml/day. Third, your weight should be stable and your energy level should be good enough that you can participate in the activities that you enjoy.

Once you and your physician have determined that your TPN can be reduced, there are two ways to approach this. You can reduce either the TPN volume that you infuse every day, or the number of days that you infuse each week. Most people prefer the latter, taking a night or two off of TPN. However, the nights off of TPN should not be back-to-back. For example, choose to skip infusing on Saturdays and Wednesdays rather than skipping Fridays and Saturdays.

During this transition, close laboratory monitoring to assess electrolyte stability and hydration status is necessary. In addition, keeping daily weights and intake and output records will help to assess hydration status.* More often than not, people need oral supplementation of vitamins and minerals as they reduce their TPN or wean off completely. Commonly, vitamin B12, zinc, magnesium, and potassium require supplementation. Liquid or chewable forms of supplements enhance absorption. Your physician and home care dietitian can recommend the appropriate vitamin and mineral supplements for you.

In summary, starting to wean off of TPN is a very complex process, and the diet modification needed is very individualized. Hopefully this article will get you thinking about the possibility of reducing your dependence on TPN, and will encourage you to discuss with your doctor your unique needs and preferences and how you can reduce your TPN use. Even one or two nights off of TPN can give you a break from the TPN routine and help enhance your quality of life.

*Glossary

- Bowel adaptation: A change in the bowel’s function to overcome the loss of a section and improve the absorption of nutrients from food.
- Electrolyte stability: Maintaining levels of electrolytes, such as potassium, magnesium, and phosphorus, within normal ranges.
- Hydration status: The current state of body water content.
- Ileum: The longest of the three sections of the small intestine, and the farthest from the stomach.
- Jejunum: The middle section of the small intestine.
- Mucosa: A mucous tissue lining in the digestive tract.
- Ostomy/stoma: An artificial or surgical opening of the bowel on the surface of the body.
- Resection: Surgical removal of all or part of an organ.
- Short bowel syndrome: A condition in which the bowel is not as long as normal, preventing the body from absorbing nutrients properly. This condition may be present at birth, or may be caused by surgery.
- Total parenteral nutrition (TPN): A method of nutrition support. Nutrition is sent into the body through an intravenous (IV) line. The digestive system is not used at all.
- Transit time: The length of time it takes for food and fluids to travel through the digestive tract.

Table 1: Oral Rehydration Solutions**

<table>
<thead>
<tr>
<th>Recipe</th>
<th>Ingredients</th>
</tr>
</thead>
</table>
| World Health Organization | - 4 cups + 3 Tbs water  
  - 3/8 tsp (1/4 tsp + 1/8 tsp) salt  
  - 2 Tbs + 2 tsp sugar  
  - 1/2 tsp baking soda  
  - 1/4 tsp Morton® Salt Substitute (potassium chloride)  
  - Sugar-free artificial sweetener to taste (e.g., Crystal Light®) |
| Gatorade® Modified      | - 2 cups Gatorade  
  - 2 cups water  
  - 1/2 tsp salt |
| G2 Gatorade             | - 4 cups Gatorade  
  - 1/2 tsp salt |

Fistula Management: A Spectrum of Nutrition Care

There are many types of fistulas, which are abnormal openings or channels between two organs or cavities. One type, an enterocutaneous fistula (ECF), affects the gastrointestinal (GI) tract (stomach, small bowel and colon).

An ECF reaches from a point in the GI tract out to the skin. Through an ECF, contents of the stomach or intestines can leak out of the body. This lost material, or output, can result in nutritional deficiencies and fluid and electrolyte* imbalance. If you have an ECF, a staged nutrition plan involving nutrition support — total parenteral* or enteral* nutrition — may help fulfill your nutritional needs, as well as help your ECF heal faster.

By Karen Hamilton, MS, RD, LD, CNSC
About ECFs

ECFs are categorized by cause, volume of output, and location. These categories are helpful because they tell your medical team what to expect in terms of fluid, electrolyte, and nutrient loss.

- **Cause:** The most common cause of ECF is trauma, which may result from an accident (such as a gunshot), from a treatment (such as radiation), or after surgery (such as from drainage from a surgical incision). Malignancy, inflammatory bowel disease, and infection can also cause fistula development.

- **Volume:** The volume of fistula output is considered either low (≤500ml/d) or high (>500ml/d), with high-volume fistulas being more challenging to manage.

- **Location:** The location of a fistula is important because it may affect not only the volume of output, but also the output’s contents.

First Stage of a Nutrition Plan

The first stage of nutritional management of an ECF includes diagnosis and stabilization. Stabilization means ensuring that your fluids and electrolytes are in balance and that it’s safe to start nutrition support. So, in addition to providing antibiotic therapy to prevent or treat infection, healthcare providers will strive to achieve rapid correction of fluid, electrolyte and acid-base balance.*

To this end, you are given large volumes of intravenous fluids containing electrolytes. Once stabilized, you can start total parenteral nutrition (TPN). TPN safely supports your higher calorie and protein needs, which are caused by loss of digestive material through the fistula as well as by increased nutrient needs, a result of wound healing. TPN also helps replace critical vitamins, minerals, electrolytes and fluids lost through fistula output.

Second Stage

Once you are stabilized, the physician can map the location of the fistula or fistulas, attempt to decrease the ECF output, and identify a route for enteral tube feeding access. A “roadmap” is identified through fistulography,* or cross-sectional imaging, to determine the length of small bowel available; this will help the physician place the enteral tube in the best location to promote nutrient absorption. At least 75 cm of small bowel is needed for successful tube feeding.

During this stage, a particular focus on skin care is needed, and a creative combination of ostomy*, supplies, skin barriers, drainage tubes, collection devices, and negative pressure dressings* are used to collect output and allow for wound healing. To provide nutrition, in some cases an enteral balloon catheter* can be passed through the wall of the ostomy bag, through the fistula, and into the intestine. This technique is called fistuloclysis and in most of the world, it is a well-accepted method to provide nutrition therapy. In other cases, a tube may be placed through the nose and into the stomach or jejunum.* Alternatively, a feeding tube may be placed into the stomach or the usable portion of the bowel using surgery or fluoroscopy.*

Once a feeding tube is placed, the goal is to provide adequate calories and protein to promote positive nitrogen balance* and fistula healing. For most ECF patients, a standard enteral formula is tolerated; however, if you have an extremely short bowel, you may need elemental or semi-elemental formula.*

In some cases, tube placement is not possible due to problems such as intestinal discontinuity (the intestine is not connected in one entire tube), multiple fistulas, insufficient usable bowel length, or intolerance to tube feedings. In these situations, TPN may be used as the sole form of nutrition therapy. Many ECF patients have been

*Please see glossary on page 12.
*Glossary

- **Acid-base balance**: A normal balance between production and excretion of acid or alkali by the body. Disease, medication, or gastrointestinal loss can cause an imbalance that needs to be corrected through the intake of IV fluids and electrolytes.
- **Antisepsis**: Avoiding infection by preventing the growth of germs.
- **Electrolyte**: An ion, such as sodium or chloride, that is required by cells to regulate the electrical charge and flow of water molecules across a cell membrane.
- **Elemental or semi-elemental formula**: A formula whose components are broken down for easier digestion and absorption.
- **Enteral balloon catheter**: A catheter used for insertion into the small intestine; it uses balloon technology to facilitate passage through a part of the intestine that may be otherwise inaccessible.
- **Enteral nutrition / tube feeding**: A method of nutrition support. Nutrition is sent directly into the stomach or small bowel through a tube.
- **Fistulography**: A diagnostic test that uses x-rays to identify the location and extent of a fistula.
- **Fluoroscopy**: An x-ray procedure that creates videos to show organs in motion.
- **Jejunum**: The middle portion of the small bowel. The jejunum is responsible for most nutrient absorption in the bowel.
- **Motility**: Spontaneous movement of food through the intestine, caused by contractions of the stomach and bowel.
- **Negative pressure dressings**: Topical treatments used in negative pressure wound therapy, which uses pressure to help heal a wound by increasing blood flow, removing bacteria, and increasing tissue growth.
- **Ostomy**: An opening in the body for the discharge of body wastes.
- **Positive nitrogen balance**: The positive state of the body in regard to intake of adequate nitrogen (protein) compared to its output.
- **Total parenteral nutrition (TPN)**: A method of nutrition support. Nutrition is sent into the body through an intravenous (IV) line. The digestive system is not used at all.

managed exclusively with bowel rest and TPN, with the fistula successfully closing as a result of good nutrition, antisepsis,* and time.

**Third Stage**

During this third stage of treatment, you will continue to receive TPN, tube feeding, or a combination of both nutrition therapies. The goal of this stage is to reduce fistula output to help the body retain more nutrients, and to promote closure of the wound. Medications used during this stage fall into four categories:

- **Medications that reduce motility***: Decreasing bowel motility increases transit time (the amount of time food spends in the bowel), which allows the small bowel to absorb more nutrients, electrolytes and fluids.
- **Medications affecting output**: Certain medications are used to either reduce the acidity of the output, which allows for better wound healing, or to decrease output overall.
- **Bulking agents**: Bulking agents, such as soluble and insoluble fiber, may help to thicken intestinal contents and thus decrease fistula output.
- **Supplements that enhance digestion**: Digestive supplements, such as pancreatic enzymes and bile salts, may be prescribed to enhance the bowel’s absorption of fat and protein.

Once output is minimized and your nutritional status is improved, your fistula may heal on its own, allowing you to transition back to an oral diet. In some cases, surgery may be needed for fistula closure; however, if you have followed a staged nutrition plan such as this one, you will be in much better shape to have a successful surgical outcome.

**References**

AVOIDING
Nutritional
COMPLICATIONS
FOLLOWING
BARIATRIC SURGERY

By Valerie Hansen
Obesity is an increasing health problem in the U.S. and around the world. Because of the health risks associated with obesity — including diabetes, high blood pressure, high cholesterol, and joint disease — surgical treatment options are available. Bariatric surgery encompasses several types of procedures that can induce rapid weight loss. Ironically, this surgery, which helps counteract the effects of eating too much food, can lead to complications including malnutrition, also called “failure to thrive.” These problems can result in the need for nutrition support, including total parenteral nutrition (TPN)* and tube feeding, or enteral nutrition (EN).*

In this article, we interview a physician who treats complications following bariatric surgery. He explains some of these complications and provides guidance to help patients undergoing bariatric surgery avoid these dangerous problems — and thus avoid the need for nutrition support.

Nearly 300,000 people in the U.S. will undergo bariatric surgery for weight loss this year. While the percentage of patients who experience complications is very low, “failure to thrive” will be an unfortunate reality for thousands of individuals.

After bariatric surgery, patients are prescribed specialized diets and vitamin supplementation to help their bodies adjust to and cope with the changes brought by the surgery.

“Gastric bypass [a type of bariatric surgery] has the same mortality rate at one year as open-heart surgery, if you can imagine that,” says Dr. Robert Martindale, MD, PhD, Professor of Surgery and Chief of the Division of General Surgery at Oregon Health and Science University. “I don’t know of any other surgery except that for cancer that has such a high mortality rate at one year — one percent.”

There are two categories of bariatric surgery. The first, called restrictive, comprises procedures that make the stomach smaller so that patients feel fuller sooner. They include the vertical banded gastroplasty* and gastric banding* procedures. The second, called malabsorptive/restrictive, comprises procedures that make the stomach smaller and, by rerouting the digestive tract to bypass part of the small bowel, prevent the body from absorbing nutrients normally. They include the duodenal switch* and gastric bypass* procedures. The malabsorptive procedures have a higher incidence of complications because they involve actually rearranging the anatomy of the gastrointestinal (GI) tract and limiting the area of the tract that can absorb nutrients.

After bariatric surgery, patients are prescribed specialized diets and vitamin supplementation to help their bodies adjust to and cope with the changes brought by the surgery. If patients don’t follow these dietary instructions, they can develop serious problems.

“By far the biggest reason people get into trouble with these operations is their failure to follow the instructions they were given during pre- and post-operative counseling,” Dr. Martindale explains. “They start feeling great, people tell them how great they look with their weight loss, and they just quit eating right and quit taking their vitamins and minerals. And as soon as they stop taking those, they begin a downhill spiral. When that spiral hits bottom, they come into the hospital depleted of several essential nutrients.”

*Please see glossary on page 24.
Nutritional intake needs to be carefully managed after bariatric surgery because the relationship between the body and the nutrients it needs to thrive is complicated. The basic nutrients — proteins, carbohydrates and fats — cannot be absorbed and used correctly by the body if there are certain deficiencies, such as a lack of iron, vitamin B or folic acid. And without proper attention to diet, these deficiencies can occur after bariatric surgery and lead to serious problems.

“Vitamin B12 deficiency causes a multitude of problems, including the inability of the nerves to correctly conduct electrical impulses,” Dr. Martindale says. “And if you don’t have enough folic acid, you can’t metabolize [process] other nutrients, including proteins, carbohydrates and fats. A deficiency of thiamine or B1 can cause severe neurological problems.”

Other Causes of Failure to Thrive
In addition to noncompliance with post-surgery instructions, other causes of failure to thrive following bariatric procedures include anatomical problems in the GI tract caused by the surgery, and psychological issues.

“The second most common complication is a problem with the gastrointestinal tract,” says Dr. Martindale. “Either the patient has lost so much absorptive surface that they have to go back for secondary surgery, or they have obstructions in the GI tract as a result of the surgery.”

The third most common problem is psychiatric issues. For instance, a patient may become anorexic* following the procedure, so they don’t eat even though they can. That also leads to malnutrition.

Failure to Thrive: Treatment Options
Reversal surgery — a procedure to “undo” the initial bariatric surgery — is only done for the most extreme cases of failure to thrive. This is because reversal increases the patient’s risk of complications tenfold. There is no easy reversal procedure, as nerves and blood supply are cut in the initial surgery.

“The only time we will do reversal surgery is in cases of extreme malabsorption* or malnutrition, chronic obstruction, or bacterial overgrowth in the intestines,” says Dr. Martindale.

The complications that are severe enough to require nutrition support (TPN and EN) usually arise within nine months to five years after surgery. Dr. Martindale has one such patient currently in his intensive care unit. This patient is a 39-year-old woman who had uncomplicated gastric band surgery. About six months later — after she had lost 146 pounds and was feeling
In this interview, Dr. Martindale points out that bariatric surgery is an increasingly common surgical procedure around the world. Many patients do well after the surgery, but some have complications. Complications or changes in the GI tract’s anatomy from the surgery may lead to issues of severe malnutrition, or “failure to thrive.” As strange as it seems, these previously obese patients cannot meet their nutrition needs by oral intake of food or nutrition supplements and are now faced with “starvation,” or complications of under-nutrition such as vitamin or micronutrient deficiency. In addition to close monitoring of their nutrition status, these patients often require the use of specialized nutrition support, such as parenteral nutrition (PN) or enteral nutrition (EN).

In these cases, EN or PN may be needed either for a short or prolonged period of time. These patients have to be monitored very closely by a clinician for issues of weight maintenance, muscle strength maintenance, and therapy-related complications such as infections. Both PN and EN can be safely delivered in the home setting by knowledgeable home infusion clinicians.

If you have had bariatric surgery, your Nourish™ Home Nutrition Support Team (HNST) can help you avoid nutritional deficiencies. Your team consists of a Registered Dietitian, a Registered Pharmacist, and a Registered Nurse who work with your ordering physician to customize your nutrition prescription to meet your unique needs. They also provide education to help you understand your role in self-care and in achieving the best possible outcome. In addition, our Registered Dietitians complete a micronutrient risk assessment for every patient receiving TPN for longer than six months. This includes an evaluation of clinical symptoms or signs that a vitamin or mineral issue may be present. It is only through this diligence that nutritional deficiencies can be diagnosed and treated before they progress to more severe complications. Finally, your HNST closely monitors your progress so that you can gradually transition back to an oral diet.

Complications after bariatric surgery sometimes occur despite everyone’s best efforts, but with a team of knowledgeable home care clinicians, your physician, and your own motivation to stay healthy, nutrition support therapies can assist you in achieving a healthy nutrition status.


Avoiding Complications

Considering the chances for severe nutritional problems after bariatric surgery — slight as they are — it is obvious that this extreme weight-loss option should be done only as a last resort. But if you and your doctor determine that it is necessary, Dr. Martindale suggests being well-informed on how the various operations work, as they all have pros and cons.

“The restrictive procedures probably have less risk than the malabsorptive ones, unless patients don’t follow the post-op instructions,” he says. “However, there is also less weight loss. The more radical the weight loss, the more risk of getting into nutritional trouble. For example, four percent of people who have the duodenal switch experience protein malnutrition, and this commonly requires a re-operation.”

The bottom line for those who opt for bariatric surgery is: follow the rules. Choose your procedure carefully with your physician, and be proactive about taking the vitamins and minerals, proteins, carbohydrates and fats necessary for maintaining a healthy body during and after the weight loss. This can help keep you be among the 96–99% of bariatric patients who avoid major complications and have a successful outcome. ♦

*Please see glossary on page 24.
“Use or lose it.” This well-known expression could have been written as the catch-phrase for the gastrointestinal (GI) tract — when it is not used, it atrophies (wastes away) until it can no longer absorb nutrients. Therefore, when GI disease prevents nutrition needs from being met orally but part or all of the GI tract is still functioning, tube feeding is the preferred route of nutrition support. This is because tube feeding sends nutrients through a tube directly into the functioning part of the GI tract so that it can digest the feeding — and thus keeps the GI tract working.
Fortunately, most GI diseases do not completely disable the GI tract, so tube feeding often serves as an excellent nutrition option when oral intake is insufficient. Keep reading to learn about the placement, formula, and administration options for tube feeding, as well as the GI diseases for which tube feeding is often used.

Considerations for Tube Feeding

Once it has been determined that all or part of the GI tract can still be used, the location of tube placement is decided. This is done by evaluating the location and severity of the impairment to the GI tract. If the patient cannot swallow because of disease of the mouth or esophagus, a feeding tube is often placed into the stomach. If the stomach does not work or has been partially or completely surgically removed due to disease, the tube is placed into the small intestine.

Formula choice is just as important as the location of tube placement. The goal is to use the most intact nutrition* the body can properly digest while meeting all nutrition and medical needs. A polymeric* formula, with whole proteins, carbohydrates, and fat, is standard. If the body has difficulty digesting these nutrients, a pre-digested formula (the proteins and other nutrients are broken down into forms that are more easily absorbed) may be used. These formulations are known as hydrolyzed or partially hydrolyzed, or as elemental or semi-elemental. Fiber-containing formulas may be beneficial to help prevent diarrhea, but fiber-free formulas are available for cases of GI inflammation or dysmotility.* High-calorie formulas may be chosen for patients with fluid restrictions or to help counteract weight loss. Disease-specific formulas are available for the management of diabetes, wounds, and renal and pulmonary diseases.

The final consideration when initiating tube feeding is the administration method. This is determined by looking at the type of tube used and the patient’s tolerance to formula volume. A feeding pump* is recommended for jejunostomy tubes (J-tubes), which are placed into the small intestine. This is because a pump provides a lower-volume, constant drip of formula, which is easier for the small intestine to tolerate (the small intestine is unable to stretch and hold as much formula as the stomach).

Formula administered through a gastrostomy tube (G-tube), which is placed into the stomach, may be given via bolus syringe or funnel, gravity, or a feeding pump. The bolus method, which provides nutrition a few times per day, is most similar to having meals and provides the most independence from the tube feeding. Administration via gravity (hanging a bag on a pole and allowing the formula to drip into the tube) is a good choice when a slower method than bolus feeding is necessary because it will increase the patient’s formula tolerance. A feeding pump may be used with a G-tube when a high risk of aspiration* is present or when a controlled volume of formula is needed to maintain stable fluid status or blood glucose.

GI Diseases for Which Tube Feeding Is Often Used

Tube feeding is often used in association with several GI diseases. Each disease is unique regarding when transition to a tube feeding is needed, what type of administration is recommended, and what type of formula is used. These diseases include:

- **Gastroesophageal reflux disease (GERD):** A condition in which the contents of the stomach flow backwards (regurgitate), up into the esophagus. This causes inflammation and damage to the esophagus.

  GERD can affect infants, children, and adults. Tube feeding may be needed when

*Please see glossary on page 24.
GERD is severe and causes aspiration pneumonia, problems moving food down the esophagus, vomiting of blood, chronic diarrhea, or delayed weight gain/growth. Infants and children may have a G-tube or a J-tube (the latter for severe cases). Infants may respond best with a continuous drip of breast milk or a thickened formula. Infants and children both respond well if food allergens are avoided by using a dairy-free, soy-free, or hypoallergenic formula. Adults with GERD do not require a feeding tube unless aspiration pneumonia becomes an issue, in which case a J-tube with a non-specialty formula may be beneficial.

- **Gastroparesis:** A condition in which the stomach muscle is paralyzed, which reduces or prevents emptying of the stomach contents into the small intestine.
  
  When severe weight loss, malnutrition, and severe disease are present, this condition may require a GJ-tube (a feeding tube that is inserted into both the stomach and the small intestine). The G-tube is used for drainage of the stomach contents, and the J-tube for feeding of the formula. Fiber-free, non-specialty formulas may meet nutrition needs, but elemental formulas are required if protein malabsorption* is present.

- **Pancreatitis:** A condition in which the pancreas (an organ that secretes substances that aid digestion) is inflamed.
  
  With mild disease, patients may tolerate a fat-modified oral diet. With severe or chronic pancreatitis, J-tube feedings are often required both to bypass the body’s trigger to secrete pancreatic enzymes and to support the patient’s increased nutritional needs. Standard formulas are often tolerated well, but with severe malabsorption, elemental or semi-elemental formulas are recommended. (See page 4 for more information about pancreatitis and nutrition support.)

- **Short bowel syndrome (SBS):** A condition in which the small bowel is not as long as normal. The condition may be present at birth, or it may be caused by surgery. With SBS, there is not enough small bowel for nutrients to be absorbed.
  
  Feeding tubes are placed after bowel reconstruction surgery for SBS. They are often used in tandem with total parenteral nutrition (TPN)* to support a patient’s needs until the tube feeding can be fully tolerated. Long-term use of a feeding tube may not be necessary if the GI tract adapts and a patient can transition to an oral diet; however, it can be beneficial in the days following surgery to help avoid malnutrition and dehydration and keep the GI tract healthy. Either a G-tube or a J-tube can be used for the tube feeding, depending upon the length and location of the intact section of the GI tract. An elemental formula administered with a feeding pump is tolerated best with both types of feeding tubes, although a standard formula may be chosen for use with G-tubes and J-tubes placed high in the small bowel.

*It is important to have a dietitian involved in your care while receiving tube feeding. He/she is essential in assisting in the transition from parenteral nutrition to a feeding tube, or from a feeding tube back to oral intake. Dietitians can answer questions that are bound to arise, and serve as an invaluable resource to help those with GI disease use the GI tract to keep it healthy.

Continued on page 24
Sharon and Ronald Frug just celebrated their 30th wedding anniversary. Unlike many couples, they didn’t mark the milestone by going out to a fancy restaurant. And they didn’t mind a bit. Sharon went on total parenteral nutrition, or TPN,* in March 2011, and ended a seven-year battle with food and 14 years of bowel obstructions, kidney stones, and chronic diarrhea. TPN literally gave Sharon and Ronald their lives back.

“It’s just night and day the difference that TPN has made in my quality of life,” Sharon says brightly. “I went to my high school reunion last year and everybody said, ‘Oh, we would know you anywhere. You look just like you did in high school.’ If they had seen me before I started on TPN when I weighed slightly more than 100 pounds, they certainly wouldn’t have said that.”

The catalyst of Sharon’s battle was actually a bleeding disorder. She has von Willebrand’s disease. Other than abnormal post-op bleeding after a childhood tonsillectomy, the condition had not caused any major problems until a wisdom tooth extraction resulted in a huge hematoma* in her face. Ronald, a radiologist, suspected a bleeding disorder right away, as did the dentist who had removed the tooth. However, soon after the tooth was pulled, Sharon became pregnant with twins and they didn’t want to test her for a bleeding disorder until after the babies were born.

“The doctor treated me as if I had already been diagnosed, and then after I delivered he sent me to be tested and the results came back positive,” Sharon explains. “That was in 1983. The twins were delivered by C-section, and I was in the hospital for eight days with post-op hemorrhaging. The bleeding didn’t stop for four months. Finally my obstetrician/gynecologist said, ‘This is not going away,’ and suggested a hysterectomy.* That resulted in more bleeding and several transfusions.”

What Sharon did not know was that the hysterectomy had also caused adhesions.* Within a decade of her hysterectomy, she began having bowel obstructions (blockages). To further complicate matters, she developed breast cancer in 2003. In January 2004, six days after she finished treatment for the cancer, she was back in the hospital with a severe bowel obstruction. The physicians could not relieve the obstruction and took her into surgery for an exploratory laparotomy.*

“The surgery showed that a mass of adhesions had formed around the distal ileum*,” says Sharon. “They removed the adhesions and checked for others.”

However, ten days later Sharon began to obstruct again. A repeat laparotomy revealed that her peritoneal cavity* was completely filled with more adhesions and blood as a result of the first surgery. The surgeon also saw areas of

*Please see glossary on page 23.
hemorrhaging within the wall of the small bowel.

“Basically only 60 centimeters of the small bowel were viable,” Sharon explains. “All the rest of it was just a knuckle ball. All they could do was an extensive small bowel resection,* which included removing the ileocecal valve*.”

The Nightmare Begins
After ten days in the hospital, Sharon was released. She had lost 18 pounds, which put her weight at under 100 pounds. She struggled to regain some weight, but every time she ate, she experienced massive bloating and cramping. By the end of the day, she looked six months pregnant and had made 30 to 40 trips to the bathroom with chronic diarrhea.

“I couldn’t travel. I could only go to the grocery store first thing in the morning before I’d had even a glass of water,” she says. “Any excursions outside my home depended on the proximity of a bathroom.”

Her small bowel gradually adapted so that Sharon was able to gain back a little weight and cut her trips to the bathroom to 15 or 20 a day, but her quality of life was miserable. She couldn’t perform her duties as an x-ray technologist, because part of her job involved commuting and she could not do that.

“My life as I knew it stopped,” she said.

In September 2004, Sharon’s doctors in Orange County finally determined that she had to be referred to UCLA Medical Center.

“My doctors said, ‘You are going to be one of the worst patients they’ve seen.’ I laughed that off — of course they had to have patients who were worse off than me. Turns out my doctors were right.”

The first test the gastroenterologist performed on Sharon was a lactulose hydrogen breath test to measure the level of bacterial overgrowth in her GI tract. The result showed massive bacterial overgrowth. Sharon had severe short bowel syndrome* and malabsorption.* The doctor put her on antibiotic treatment immediately, as well as a low-fat diet.

“We tried everything from tincture of opium to codeine to slow down the gut and cut down...
on my bathroom episodes,” Sharon says. “When the intestinal rehabilitation group — the TPN department at UCLA — put me on codeine I thought, ‘Gosh, this is making my life a little better.’ But within two months I started having severe abdominal pain. I thought I was obstructing again.” She was wrong. This time the problem was kidney stones. The part of the small bowel the surgeons had removed is the part of the GI tract that removes oxalates* from the body. Without that section, the oxalates travel to the kidneys and begin forming stones. In Sharon’s case, the stones came in massive amounts. She began seeing a urologist and learned that her kidney function was moderately compromised due to secondary oxalosisis.* Over time, she underwent eight laser lipotripsies.*

Sharon went on a low-oxalate diet, avoiding most plant foods, fruits, vegetables, nuts and chocolate. Thus her diet, which had already been restricted because of the short-bowel syndrome, became even more so.

A TPN Trial Changes Her Life

Sharon’s general gastroenterologist at UCLA, Dr. Kirsten Tillisch, suggested that she try a TPN trial. Sharon was referred to Dr. Jorge Vargas.

“Dr. Vargas took one look at me and said, ‘I think we can get you a better quality of life, period.’ Basically what he was saying was that I had suffered long enough. That was in January 2011 and I was scheduled for a TPN trial in March,” Sharon says.

“It amazed me how much UCLA and Coram changed my life. Within 24 hours of being admitted for the trial, the doctors had the formula set. By the end of the week, we had it fairly stabilized. Lily Wu at Coram [a Nutrition Support Dietitian] is my hero. She came and visited me in the hospital to get the records I had kept over the span of eight years, and got the ball rolling and the insurance coverage squared away. I went home, and almost waiting for me — literally at my door within 30 minutes — was the home health nurse arranged by Coram. That’s when my life changed. The home health nurse taught my husband, my daughter and myself what to do, why we were doing it, and what they could do to help me. To keep my colon functioning, white foods were allowed in limited amounts. I could have white toast, an egg white, white rice and white chicken breast only.”

Sharon started getting TPN for 12 hours a night and began seeing the difference almost immediately. Not only did the nutrition treatment stop the bloating and the chronic diarrhea, it also lowered the levels of oxalates in her body. Normal oxalate level is 40. In January 2011, Sharon’s level was 181 and had been that high consistently for five years. In May 2011, her oxalate level was 43.

“I just can’t say enough about my doctors at UCLA. They were pit bulls on my behalf, as was my husband. He was just a rock. He was there for every surgery. And he was also my advocate. This was really something of a test for us, and fortunately, we not only made it through the test together, we made it through the test stronger.

“Ron’s brother came to visit us every summer since we couldn’t travel to Boston. In July of 2011 we were all able to take an extended walk outside for the first time. My normal weight was restored by then. As we parted that night, my brother-in-law said to me, ‘This is a miracle.’ I guess you could say that TPN was my miracle.” ♦
*Glossary*

- **Adhesions**: Tissues that become joined together abnormally.
- **Bowel resection**: Surgical removal of a portion of the bowel.
- **Distal ileum**: The last portion of the small intestine (farthest from the stomach).
- **Hematoma**: A mass of clotted blood that forms in body tissue, causing the tissue to swell.
- **Hysterectomy**: Surgical removal of the uterus.
- **Ileocecal valve**: A flap of tissue that prevents backward flow of material from the colon to the small bowel; aids in slowing intestinal contents to enhance nutrient absorption.
- **Laparotomy**: A surgical procedure that removes a section of the abdominal wall.
- **Laser lithotripsy**: A medical procedure during which laser pulses target kidney stones and pulverize them so they can be washed out of the body in the urine.
- **Malabsorption**: Difficulty absorbing nutrients from food.
- **Oxalates**: Compounds that are found naturally in the body as well as in certain foods. In some individuals, intake of high-oxalate foods combined with high output of calcium in their urine (hypercalciuria) produces kidney stones.
- **Oxalosis**: A condition in which abnormal deposits of calcium oxalate are formed in the kidneys and other parts of the body.
- **Peritoneal cavity**: The peritoneum is a transparent membrane that lines the interior of the abdomen and consists of an outer and inner layer. The peritoneal cavity forms when these two layers spread apart.
- **Short bowel syndrome**: A condition in which the bowel is not as long as normal, preventing the body from absorbing nutrients properly. This condition may be present at birth, or may be caused by surgery.
- **Total parenteral nutrition (TPN)**: A method of nutrition support. Nutrients are sent into the body through an intravenous (IV) line. The digestive system is not used at all.
- **von Willebrand's disease**: A genetic disorder that prevents blood from clotting correctly.
Avoiding Nutritional Complications Following Bariatric Surgery

(continued from page 14)

*Glossary

- **Absorptive surface**: The surface of the GI tract that is exposed to food, allowing for absorption of nutrients.
- **Anorexic**: Suffering from anorexia nervosa; key aspects of this condition are fear of weight gain and resulting self-starvation.
- **Enteral nutrition / tube feeding**: A method of nutrition support that sends nutrients directly into the stomach or small intestine through a tube.
- **Exploratory scope**: The use of an endoscope to examine areas inside the body, such as the esophagus and stomach. An endoscope is a narrow tube that holds a tiny camera with a light.
- **Gastrointestinal tract**: The organs of the body involved in digestion, including the esophagus, stomach, and intestines.
- **Malabsorption**: The inability of the body to absorb nutrients from the GI tract. It typically leads to weakness, diarrhea, muscle cramps, and weight loss.
- **Total parenteral nutrition (TPN)**: A method of nutrition support that sends nutrients directly into the body through an intravenous (IV) line. The digestive system is not used at all.

Types of bariatric surgery include:

- **Gastric banding**: A band is placed around part of the stomach, creating a small section of stomach that can hold only a small portion of food.
- **Vertical banded gastroplasty**: A variation of gastric banding. A band is placed to create a small pouch of stomach, and a vertical line of staples directs food through the band.
- **Sleeve gastrectomy**: A portion of the stomach is removed, making the stomach into a “sleeve” shape. The portion removed is where the hunger hormone, ghrelin, is produced, so the hunger sensation is reduced after surgery.
- **Gastric bypass**: This usually involves reducing the size of the stomach and then reconnecting the now-smaller stomach to the mid-section of the small intestine, “bypassing” the first section. This procedure is performed to restrict food intake and reduce the amount of calories and nutrients that can be absorbed.
- **Duodenal switch**: A surgical procedure that includes restrictive and malabsorptive features. The restrictive feature involves removing over 70% of the stomach. The malabsorptive feature reroutes a lengthy section of the small intestine, resulting in a very small section of the intestine that can actually absorb nutrients. This procedure is also known as biliopancreatic diversion with duodenal switch.

The Use of Tube Feeding in GI Disease

(continued from page 19)

intestine or if severe malabsorption is not a concern.

- **Crohn’s disease**: A chronic inflammatory disease that affects the intestines.

In children, this condition requires the initiation of a tube feeding via G-tube with a standard formula. This is done at diagnosis to prevent growth delay. Adults may only require tube feedings during flare-ups, using a standard formula; however, in cases of malabsorption, polypeptide and elemental formulas may be used.

The thought of tube feeding can seem intimidating, but when GI disease prevents tolerance or absorption of an oral diet, it is a great option to help keep your GI tract healthy until an oral diet can be taken again.

*Glossary

- **Aspiration**: Accidental intake of food particles or liquids into the lungs.
- **Dysmotility**: Problems with movement of food and waste through the digestive tract.
- **Feeding pump**: A type of pump that delivers nutrition formula into a feeding tube.
- **Intact nutrition**: “Whole” nutrition that makes the body work to digest it. This is opposed to nutrition in semi-elemental or elemental formula, which is broken down into components for easier digestion.
- **Malabsorption**: Inadequate absorption of nutrients from food by the intestines.
- **Polymeric**: Intact or “whole” nutrients that include protein, carbohydrate and fat that require digestion by the GI tract.
- **Total parenteral nutrition (TPN)**: A method of nutrition support. Nutrients are sent into the body through an intravenous (IV) line. The digestive system is not used at all.

References:

2012 Small Steps to Big Steps
A Nutrition Support Consumer Teleconference Series

As a leader in long-term nutrition support, Coram understands the value of patient education. We are pleased to offer our free, informational teleconference series, Small Steps to Big Steps, which is a great way for nutrition consumers and their caregivers to learn about timely and relevant topics that affect them.

Join Us
Join us from the comfort of your home or office for one of our upcoming Small Steps to Big Steps teleconference calls.

Call toll-free: 866.418.5399
Passcode: 3036728726
Time: 7:00 pm EST/4:00 pm PST

May 15
Oral Care for the Nutrition Support Consumer
Presented by Suzanne Plum, DDS

July 17
Input That Stays Put
Presented by Carol Ireton-Jones, PhD, RD, LD, CNSC and Therese Austin, MS, RD, LD, CNSC

September 18
Healthcare Reform: What Consumers Need to Know
Presented by Lisa Getson, Executive VP Government Relations and Corporate Compliance, Apria Healthcare

November 20
New Technologies and Innovations for the HPEN Consumer
Presented by Melissa Leone, RN, BSN

The Small Steps to Big Steps consumer teleconference series, brought to you by Coram Specialty Infusion Services (the presenter), is provided free of charge to the community. Opinions expressed by contributing speakers and sources are not necessarily those of the presenter. The presenter does not intend for these teleconference calls or any related program(s) to endorse any particular provider. Information contained in these teleconferences is for educational purposes only and is not intended as a substitute for medical advice. Do not use this information to diagnose or treat a health problem or disease without consulting a qualified physician. Please consult your physician before starting any course of supplementation or treatment, particularly if you are currently under medical care. Never disregard medical advice or delay in seeking it because of something you have heard in this teleconference. © 2012 Coram Specialty Infusion Services. All rights reserved. No part of these teleconferences may be disseminated, distributed, or reprinted without prior written permission of the copyright owner. All service marks, trademarks, and trade names presented or referred to in these teleconferences are the property of their respective owners.
Medication Management to Treat and Control the Symptoms of GI Diseases

Medications are sometimes used to treat gastrointestinal (GI) diseases. More often, they are used to treat related symptoms to improve patient quality of life. This article reviews the types of GI diseases for which medications are often prescribed, and how these medications help to relieve symptoms.

The GI Tract and Medications

When part of the GI tract is not working well, it can cause problems from inconvenience and discomfort to severe illness. Some problems, such as travelers’ diarrhea or food poisoning, are caused by eating or drinking the wrong quantities, types, or qualities of foods or liquids. Other problems are due to GI diseases such as Crohn’s disease, pancreatitis, fistulas, gastroparesis, short bowel syndrome, or failure to thrive after bariatric (weight-loss) surgery. And some problems can even be the result of side effects from medications used to treat these diseases.

There are many types of medications that can help relieve symptoms related to GI diseases. Some of these medications work to stop diarrhea and to dissipate gas, bloating and belching. Others can help the body digest food, decrease acid burning, or soften or increase the quantity of stool. Still others can increase appetite, decrease nausea and vomiting, or decrease pain.

It is important to remember that many medications, while they help relieve a symptom, can actually cause other symptoms. For example, medication to treat constipation can cause diarrhea, and medication used to decrease nausea, acid stomach, or pain can cause constipation. When medications are the cause of discomfort, other medications are often ordered to help manage the problematic symptoms.

GI Diseases Often Treated with Medication

GI diseases that often require treatment with medications include the following:

**Crohn’s disease** is a chronic inflammatory disease that affects the GI tract, including the intestines (bowels). Inflammation in the bowel causes diarrhea, pain, cramping, ulcers, reduced appetite, and weight loss. Crohn’s often requires treatment with bowel rest, medications, and sometimes surgery.
• **Medications used:** Medications may be used to manage symptoms. They may also be used to put the disease in remission (a resting phase that quiets the inflammation of the bowel). Medications include some antibiotics, which change the natural bacteria in the GI tract that trigger the internal inflammation. Anti-inflammatory medications and steroids can also be used; these work directly on decreasing the inflammation. In addition, anti-metabolites and immunomodulators can help decrease the body’s reaction to inflammation.

**Gastroparesis**, which is a lack of movement in the GI tract, often results from other diseases such as diabetes. When movement is stopped in the gut, one experiences a feeling of fullness, nausea, bloating and heartburn that progresses to lack of appetite, vomiting, changes in blood sugar levels, and weight loss.

- **Medications used:** A GI stimulant may be used to get the GI tract moving again until the underlying cause has been corrected.

For the majority of other GI diseases, such as pancreatitis, fistulas, short bowel syndrome, and failure to thrive after bariatric surgery, medications can be used to help relieve the symptoms, but do not cure the disease or promote remission.

**Pancreatitis** occurs when the pancreas, which produces digestive enzymes and insulin, becomes inflamed. Abdominal tenderness, abdominal pain, nausea, vomiting, weight loss, and oily stools are some of the symptoms. Removal of any substance thought to have caused it, such as alcohol, along with rest and management of the symptoms are prescribed until the inflammation decreases.

- **Medications used:** Pain medications are often prescribed during the most severe phase of pancreatitis. Antiemetic medication (prevents nausea) and enzymes may also be ordered to enhance a person’s ability to take in and digest their diet until their pancreas is working fully again. In some cases, antibiotics are prescribed to manage infection.

---

**Working with Your Healthcare Providers**

When you are prescribed a medication to treat a GI problem, it is always important to let your physician or pharmacist know about any other medications you are taking, including over-the-counter (non-prescription) medications, herbals or supplements, even if these are prescribed by another physician. Also, be sure to keep your physician and/or pharmacist informed of any changes in your symptoms. Some changes in symptoms may be a side effect from your medication or treatment, while others may be signs of a change in your disease.

Your healthcare providers will recommend treatment according to the symptoms of your GI disease. Because medications cannot cure the majority of GI diseases, most medications that are recommended (both prescribed and over-the-counter) address disease symptoms, primarily those that significantly impact your quality of life.
**Fistulas** are non-natural openings that occur between body systems such as the GI tract and the skin. Fistulas require management of drainage, as well as replacement of what is being lost from the body, such as fluids and electrolytes, until the opening can be closed.

- **Medications used:** In some cases, antibiotics are prescribed to manage infection that occurs in the wound, and anti-secretory agents are provided to reduce the volume of secretions.

**Short bowel syndrome (SBS)** is a condition in which the normal length of the GI tract has been shortened, usually due to surgery to treat another disease or, in some cases, due to trauma. This results in less bowel length to absorb nutrients and fluids.

- **Medications used:** The associated diarrhea, fatigue, cramping, bloating, heartburn and nutrient deficiencies can all be decreased with medication.

**Failure to thrive** after bariatric surgery occurs when malnutrition and other problems arise due to surgery to promote weight loss.

- **Medications used:** Medications can help relieve the symptoms of cramping, bloating and diarrhea that may occur. They can also help resolve vitamin and mineral deficiencies.

**Medications**

There are many medications used to control GI disease-related symptoms. See Table 1 (on opposite page) for a brief summary of each medication classification and what symptoms they are prescribed to relieve.

**GI Disease, Medications and You**

If you have a GI disease, you are probably taking one or more of the medications in Table 1. You may wonder what you can do to minimize symptoms and ensure that your treatment helps improve your quality of life. Each medication prescribed should be dispensed with a patient information sheet for your review. It should list: the name and description of the medication; what it is used for; how to take it; when not to use it; special medical conditions that may cause issues with the medication; common side effects, adverse effects, or drug interactions; and proper storage. If you do not have this medication fact sheet for each prescription item, ask your pharmacist for a copy and be sure to read it thoroughly. If you have any questions about your medications or the symptoms you may be having as a result of taking these medications, contact your physician or pharmacist. Write down your questions about your symptoms and medications and ask them at your next visit, appointment or prescription pick-up, or simply call them to discuss.

It is okay to talk with others about what they have used, or to look up information on the Internet, but remember — ultimately your physician makes his/her decision about which medication you should take, and what dose you should use, based on your unique disease, your symptoms, other diseases that you may be treated for, your age, your current side effects, and how your body responds to the medication. So, it is important that you take your prescription as directed. Talk to your physician or pharmacist if your symptoms do not improve, get worse, or if you develop new symptoms. Your physician’s goal is to help you reduce your disease-related symptoms and to allow you to get back to the life you want. ♦
Table 1: Medications Used to Control GI Disease-related Symptoms

<table>
<thead>
<tr>
<th>Medication</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antacids</td>
<td>To decrease acid indigestion, heartburn, and the related sour or upset stomach that may occur.</td>
</tr>
<tr>
<td>Antidiarrheals</td>
<td>To control diarrhea through decreasing volume and frequency of bowel movements.</td>
</tr>
<tr>
<td>Antiemetics</td>
<td>To relieve nausea and vomiting.</td>
</tr>
<tr>
<td>Anti-flatulents</td>
<td>To relieve pressure, bloating and discomfort associated with excess gas in the GI tract.</td>
</tr>
<tr>
<td>Anti-spasmodics</td>
<td>To reduce contractions of the GI tract, thus decreasing gastric secretions, cramps, and pain.</td>
</tr>
<tr>
<td>Digestive enzymes</td>
<td>To decrease diarrhea and improve absorption of food.</td>
</tr>
<tr>
<td>Dextrose, normal saline, or Ringer’s lactate, as well as many other fluids and electrolytes</td>
<td>To replace the fluids and electrolytes* lost through vomiting, diarrhea or ostomy* output.</td>
</tr>
<tr>
<td>H2 antagonists and proton pump inhibitors</td>
<td>To treat ulcers or to relieve heartburn and sour stomach associated with excess stomach acid production.</td>
</tr>
<tr>
<td>Laxatives</td>
<td>To ease constipation by stimulating bowel muscles to contract and by accumulating water in the bowel to soften stool.</td>
</tr>
<tr>
<td>Octreotide</td>
<td>To decrease secretory diarrhea associated with dumping syndrome,* or to decrease fistula output by lengthening the time it takes for food to travel through the GI tract.</td>
</tr>
<tr>
<td>Opioid medications</td>
<td>To relieve pain.</td>
</tr>
</tbody>
</table>

*Glossary

- **Dumping syndrome**: A condition that occurs when the stomach or small bowel cannot retain its contents due to injury, resulting in rapid transport of digestive contents through the GI tract, and the reduced ability for the body to digest and absorb nutrients.

- **Electrolytes**: Essential salts — such as sodium, potassium and chloride — that are used by the body during the metabolism (processing) of nutrients.

- **Ostomy**: An opening in the body for the discharge of wastes.
Steering Clear of Complications

Whether you are new to the world of nutrition support or a long-time consumer, you have been furnished with an abundance of information, training and advice on how to take care of yourself. This article is not meant to replace your training; rather, the following tips are meant to help you use your training to avoid the avoidable complications, and to manage the unavoidable ones.

Educate yourself and your caregiver.

Learning about your treatment and condition can help you be both safe and independent at home. This is the best advice I can give someone new to home parenteral or enteral nutrition (HPEN). For the long-term veteran, my best advice is to review and refresh your training periodically so you don’t slip into any habits that may set you up for complication development. Also, be sure to stay abreast of new information that can help keep you healthy and safe.

One of the best ways to gather information is to seek out educational opportunities with your home infusion company or hospital. The members of your care team stay current with medical and scientific publications as well as new, proven, safe products that can improve your quality of life and help you avoid complications. They are an invaluable source of information and they welcome your questions. Through our Nourish™ Nutrition Support Program, you have access to a variety of educational materials, including: this quarterly magazine; our great website WeNourish.com, which features many valuable resources; and our consumer teleconference series, Small Steps to Big Steps, which is convenient, free, and available every other month. Through these and other programs, you can educate yourself about your condition and about how you can keep yourself healthy while receiving nutrition support.

Wash your hands.

This might seem overstated, but it is one of the most important things you can do to help keep yourself healthy. When in doubt — wash again. For new consumers, you probably think, “Is all this handwashing necessary?” Not only is it necessary for you, but also for anyone who helps with your care. This simple practice has been proven to prevent many complications.
**Keep current on your lab tests.**

Your doctor and home nutrition support team track your lab values, but if you monitor them as well, you will be alerted to any changes and can ask your team how the changes may impact your health. Communication with your team will ensure that therapy adjustments for your specific needs occur in a timely fashion, and will help to prevent complications or correct any issue in its early stages. You can also help by making sure that you let your doctor and home nutrition support team know when and where you have labs drawn.

**Be your own advocate.**

Learn to express your concerns and needs. Subtle health changes might not be easily identified by just an examination. Tell your doctor and care team about any changes in your health or the way you’re feeling, or if something seems different to you. You know your body better than anyone. Make sure that you write down your concerns and have them ready when you speak with your care providers — this can help you remember.

**Do what makes you happy.**

This sounds simple — and it is — but many people feel that they cannot enjoy life once they start HPEN. You might have to make adjustments, but with a little effort, you can do just about anything. I have met people on nutrition support who have gone on safaris, camping trips, and cruises, traveled to family reunions, and enjoyed mountain climbing. Not everything is possible, but if you do some planning and work with your doctor and home nutrition support team, many trips are possible.

If travel isn’t your thing, maybe taking a class at the local community center would give you the mental rest and relaxation we all desire. Or try volunteering — I know many people who find that helping others gives them joy. Think about what would make you happy and if your doctor agrees, then go for it.

We nourish your body and we want to help you nourish your life. By working with your care team and following these tips, you can help yourself avoid complications and make the most of living with HPEN. ♦
Consumer Contacts

Celebrate Life Magazine
To submit stories, comments, and suggestions for Celebrate Life, email: celebratelife@coramhc.com

WeNourish.com
- General information about the Nourish Nutrition Support Program
- Educational tutorials, videos and downloadable patient education tools
- Consumer events and teleconferences
- Online archive of Celebrate Life magazine
- Consumer resource links
- Local Coram branch maps and information

877.WeNourish (877.936.6874)
Call to speak to a TPN or tube feeding representative.

Nourish Advocacy Line
To reach a dedicated Consumer Advocate, call:
Toll-free 866.446.6373

Informational Teleconference Series
To view a schedule of upcoming teleconference topics and times, visit:
WeNourish.com/consumers/events.aspx

Connect With Us
facebook.com/coramhc
twitter.com/coramhc

Celebrate Life
For Home TPN and Tube Feeding Patients

555 17th Street, Suite 1500, Denver, CO 80202

Celebrate Life is a publication of Coram Specialty Infusion Services.